Basic EDA with Healthcare Twitter Analysis datasets

Some parts drawn from Matthew A. Russell *Mining the Social Web*

Pull out individual words, hashtags, users mentioned and URLs

In [10]:
```
#
# "find_WordsHashUsers" is part of twitter_functions on the GitHub repo
#
# It pulls all the individual words, hashtags, user-mentions and URLs
# out of any *.csv file containing tweet text in some column
#
from twitter_functions import find_WordsHashUsers

word_list, hash_list, user_list, url_list, num_tweets = \
          find_WordsHashUsers("../files/Tweets_Celiac_full.csv", "content",
"list")

from collections import Counter

for item in [word_list, user_list, hash_list, url_list]:
    c = Counter(item)
    print c.most_common()[:10] # top 10
    print
```

```
[('rt', 1734), ('to', 1675), ('the', 1536), ('a', 1436), ('for', 1349), ('of'
, 973), ('you', 966), ('is', 958), ('with', 881), ('and', 863)]

[('celiacbeast', 237), ('jenniferswayje', 206), ('thedailyshow', 133), ('glut
endude', 131), ('gfreeradio', 110), ('gfreeschool', 79), ('glutinofoods', 70)
, ('udisglutenfree', 68), ('celiacawareness', 66), ('rudisglutenfree', 56)]

[('celiac', 5505), ('glutenfree', 2933), ('coeliac', 788), ('gf', 705), ('glu
ten', 525), ('gfree', 266), ('health', 194), ('abcdrbchat', 155), ('college',
 128), ('foodallergy', 115)]

[('http://t.co/kliv5zfntq', 79), ('http://t.co/5rty8ts2rh', 67), ('http://t.c
o/qnttxkvxy1', 44), ('http://t.co/bne5lmo8zr', 43), ('http://t.co/ve9kfykgle'
, 42), ('http://t', 40), ('http://t.co/p9a8ezcnm7', 36), ('http://t.co/g2ztri
mtzn', 33), ('http://t.co/vviypdhwxh', 24), ('http://t.co', 21)]
```

Remove the stop words

In [11]:
```
from nltk.corpus import stopwords

stop = stopwords.words('english')
stop.append('&amp;')
stop.append("it's")
stop.append('w/')

filtered_word_list = [word for word in word_list if word not in stop]
filtered_word_set  = set(filtered_word_list)
```

Display the top ten words, users mentioned, hashtags & URLs

In [3]:
```
from prettytable import PrettyTable

for label, data in (('Word', filtered_word_list),
                    ('Screen Name', user_list),
                    ('Hashtag', hash_list),
                    ('URL', url_list)):
    pt = PrettyTable(field_names=[label, 'Count'])
    c = Counter(data)
    [ pt.add_row(kv) for kv in c.most_common()[:10] ]
    pt.align[label], pt.align['Count'] = 'l', 'r' # Set column alignment
    print pt
```

```
+-------------+-------+
| Word        | Count |
+-------------+-------+
| rt          |  1734 |
| disease     |   553 |
| gluten      |   541 |
| free        |   368 |
| new         |   280 |
| gluten-free |   262 |
| celiac      |   233 |
| get         |   212 |
| great       |   205 |
| awareness   |   196 |
+-------------+-------+
+-----------------+-------+
| Screen Name     | Count |
+-----------------+-------+
| celiacbeast     |   237 |
| jenniferswayje  |   206 |
| thedailyshow    |   133 |
| glutendude      |   131 |
| gfreeradio      |   110 |
| gfreeschool     |    79 |
| glutinofoods    |    70 |
| udisglutenfree  |    68 |
| celiacawareness |    66 |
| rudisglutenfree |    56 |
+-----------------+-------+
+-------------+-------+
```

Hashtag	Count
celiac	5505
glutenfree	2933
coeliac	788
gf	705
gluten	525
gfree	266
health	194
abcdrbchat	155
college	128
foodallergy	115

URL	Count
http://t.co/kliv5zfntq	79
http://t.co/5rty8ts2rh	67
http://t.co/qnttxkvxy1	44
http://t.co/bne5lmo8zr	43
http://t.co/ve9kfykgle	42
http://t	40
http://t.co/p9a8ezcnm7	36
http://t.co/g2ztrimtzn	33
http://t.co/vviypdhwxh	24
http://t.co	21

Lexical Diversity and per-Tweet Averages

In [12]:
```
word_set, hash_set, user_set, url_set, num_tweets =  \
          find_WordsHashUsers("../files/Tweets_Celiac_full.csv", "content",
"set")

# A function for computing lexical diversity
def lexical_diversity(set_, list_):
    return 1.0*len(set_)/len(list_)

# A function for computing the average number of entity per tweet
def average_words(list_, num_tweets):
    return 1.0*len(list_)/num_tweets

print "Lexical Diversity"
print "words  %0.2f"%lexical_diversity(word_set, word_list) # word_list not f
iltered_word_list
print "hashes %0.2f"%lexical_diversity(hash_set, hash_list)
print "users  %0.2f"%lexical_diversity(user_set, user_list)
print "urls   %0.2f"%lexical_diversity(url_set, url_list)

print "\nAverage per tweet"
print "words           %0.2f"%average_words(word_list, num_tweets)
print "filtered words  %0.2f"%average_words(filtered_word_list, num_tweets)

print "hashes          %0.2f"%average_words(hash_list, num_tweets)
print "users           %0.2f"%average_words(user_list, num_tweets)
print "urls            %0.2f"%average_words(url_list, num_tweets)
```

```
Lexical Diversity
words  0.13
hashes 0.09
users  0.23
urls   0.64

Average per tweet
words           11.60
filtered words  7.29
hashes          3.11
users           0.88
urls            0.76
```

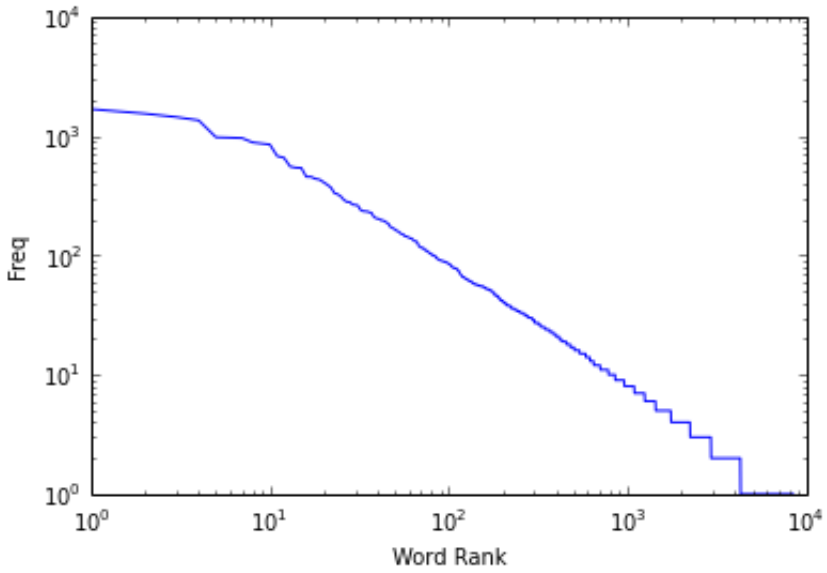
Word Cloud

In [9]:
```
from pytagcloud import create_tag_image,make_tags
import IPython.display

# 'rt' is very common and useless
filter_ex_rt = list(filtered_word_list)
while 'rt' in filter_ex_rt:filter_ex_rt.remove('rt')

for item in [filter_ex_rt]:
    c = Counter(item)

num_tags = min(100,len(c.most_common())-1)
tags     = make_tags(c.most_common()[:num_tags], maxsize=120)

create_tag_image(tags, 'wordcloud.png', size=(800,800), fontname='Lobster' )

IPython.display.display(IPython.display.Image(filename='wordcloud.png'))
```

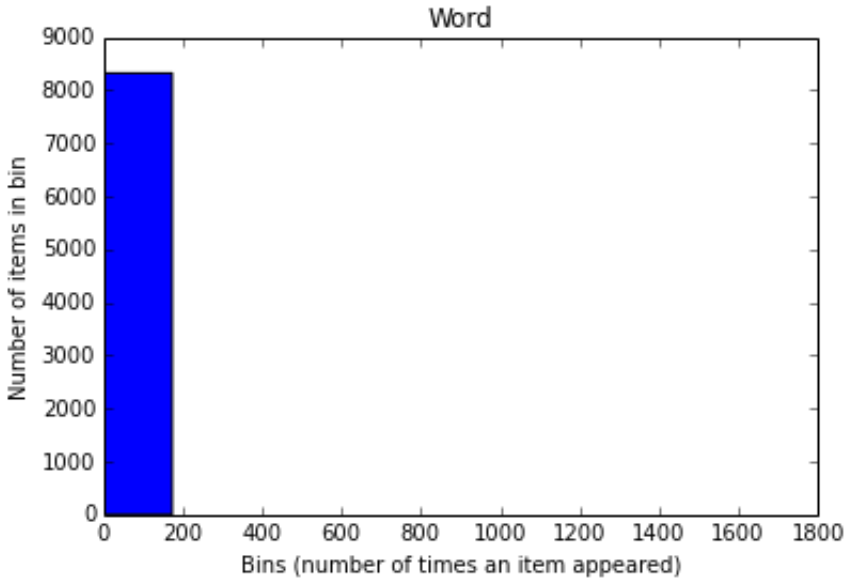
Frequency Binning

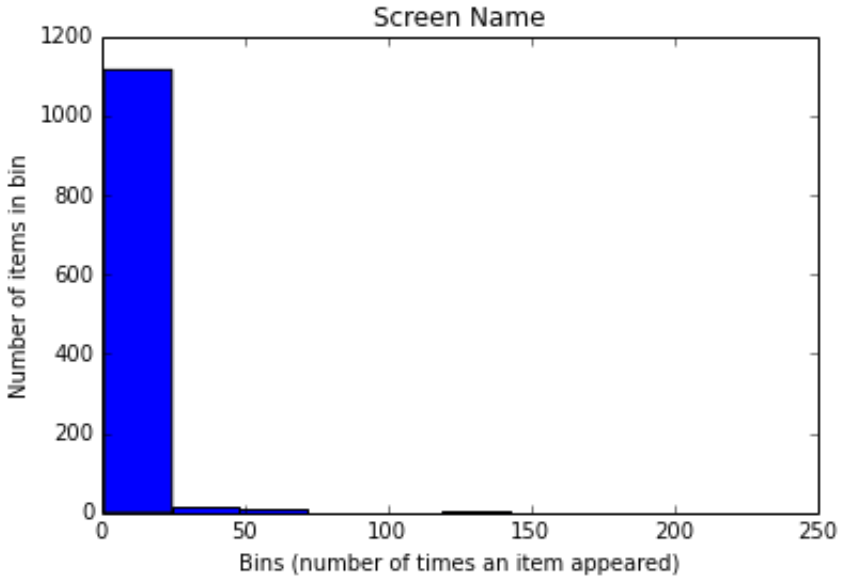
In [6]:
```
word_counts = sorted(Counter(word_list).values(), reverse=True)

plt.loglog(word_counts)
plt.ylabel("Freq")
plt.xlabel("Word Rank")
```

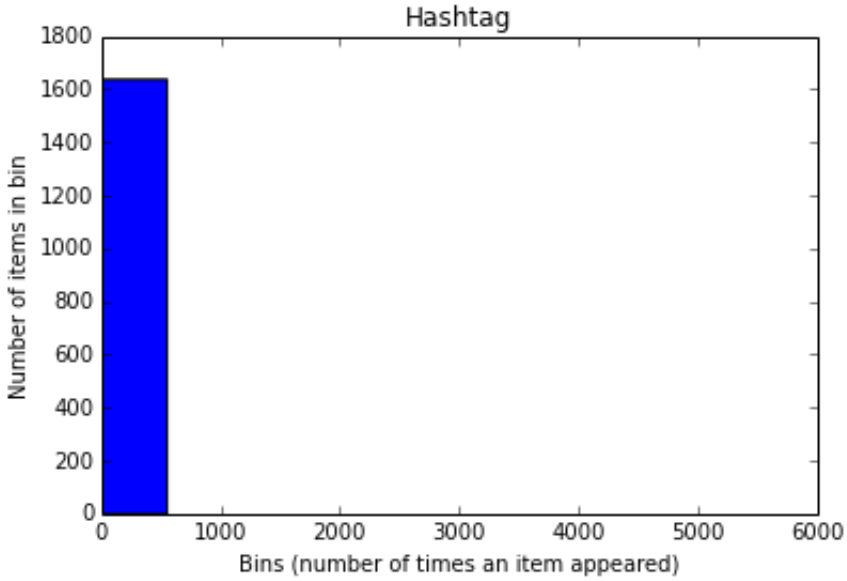
Out[6]: <matplotlib.text.Text at 0x1162f0f0>

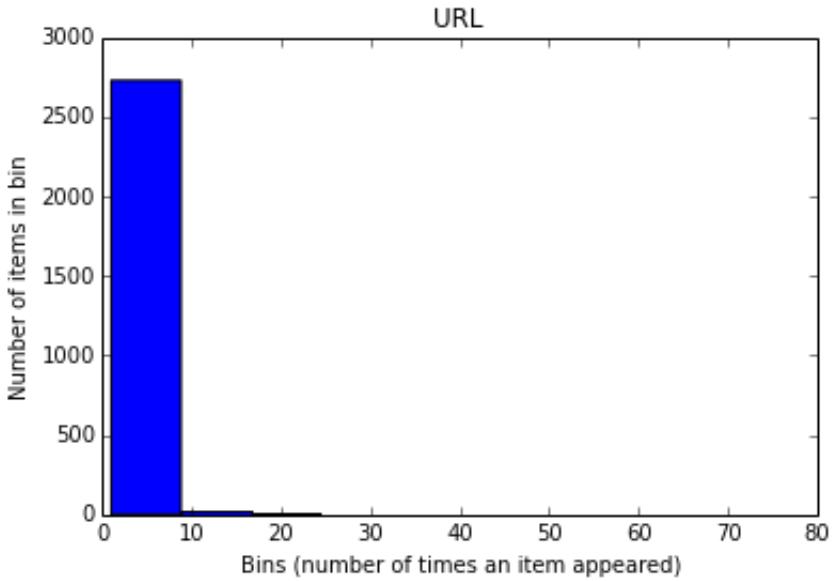


In [7]:
```
for label, data in (('Word', filtered_word_list),
                    ('Screen Name', user_list),
                    ('Hashtag', hash_list),
                    ('URL', url_list)):

    # Build a frequency map for each set of data
    # and plot the values
    c = Counter(data)
    plt.hist(c.values())

    # Add a title and y-label ...
    plt.title(label)
    plt.ylabel("Number of items in bin")
    plt.xlabel("Bins (number of times an item appeared)")

    # ... and display as a new figure
    plt.figure()
```


Word
Number of items in bin
Bins (number of times an item appeared)
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
0
200
400
600
800
1000
1200
1400
1600
1800


Screen Name
Number of items in bin
Bins (number of times an item appeared)
0
200
400
600
800
1000
1200
0
50
100
150
200
250


Hashtag
Number of items in bin
Bins (number of times an item appeared)
0
200
400
600
800
1000
1200
1400
1600
1800
0
1000
2000
3000
4000
5000
6000




```
<matplotlib.figure.Figure at 0x10a32588>
```

In [7]: